# Individual social capital and willingness to contribute money for the environment

**N. Jones[1, *], C. Malesios[2], I. Botetzagias[1]**

[1] Centre for Environmental Policy and Strategic Environmental Management, Department of the Environment, University of the Aegean, Mytilene
[2] Department of Statistics, Athens University of Economics and Business, Athens
* Corresponding author: jones@env.aegean.gr, tel.: +302251036245

Paper prepared for the 8th Conference of the European Sociological Association, Glasgow, September 2007

## Abstract

Individuals tend to act for the common benefit of their community if certain elements of social capital exist (Coleman, 1990; Putnam, 1993, 2000). Consequently, it is assumed that citizens will tend to cooperate for the long-term improvement and conservation of natural resources in communities with high stocks of social capital (Pretty, 2003). The aim of this article is to examine these assumptions by connecting individual social capital to the willingness of individuals to contribute money for environmental improvement. Data were obtained from European Values Survey (1999/2000) and individual social capital was estimated through the inclusion of four factors: trust (institutional and social), formal social networks, social norms and civic participation. The analysis conducted indicates that stocks of social capital influence the tendency of individuals to contribute (or not contribute) money for environmental goods. Through the study, empirical proof is provided for the connection between individual social capital and attitudes concerning natural resources.

Keywords: Social capital, Social capital and Environment, Willingness to Pay, Confirmatory Factor Analysis

## 1. Introduction

Social capital refers to social trust, the density of social networks, the tendency of compliance to social norms and other social features, which influence the collective activity of individuals (Putnam, 1993, p. 167; Coleman, 1990). One of the main reasons that theories concerning social capital have expanded rapidly (see Bourdieu, 1986; Putnam, 1993, 2000; Coleman, 1990), is due to the identification of several consequences deriving from its existence, both on individual and community level. Indicative example is the influence of social capital on individual health status (e.g. Poortinga, 2006) and on academic achievement of individuals (e.g. Sandefur et al., 2006).

Social capital has also been linked to issues of environmental policy and management (see Flora, 1995; Selman, 2001; Pretty, 2003). This connection mainly derives from the influence of components of social capital on individuals attitudes towards environmental issues. In particular, higher stocks of social capital may lead to minimization of free-riding behaviours (Coleman, 1990) and to a higher compliance to social norms which imply benefits for the conservation of natural resources (Pretty, 2003). In addition, several studies indicate the importance of enforcing 'weak' elements of social capital when planning and applying an environmental policy in a community (see Jones, 2006).

In this context, the present study aims to investigate the influence of social capital on the tendency of individuals to contribute money for the environment. The study is influenced from the field of environmental economics and particular from Willingness to Pay (WTP) questions which are used for the valuation of environmental goods (see Mitchell & Carson, 1989). Through environmental valuation studies, there is significant research which investigates factors which influence individuals' decision to declare or not declare a certain amount. Nevertheless, the influence of social factors on WTP, including social capital components, has not been investigated in depth (Jones et al., 2007). In the following paragraphs an attempt to isolate social factors and explore their influence on individual WTP for the environment will be presented.

## 2. Sample and data analysis

### *2.1. Sample*

For the purpose of the study, data were collected from European Values Survey (EVS) (wave four, 1999) for 24 countries[1] (Table 1). Analysis was conducted in two main stages. The first stage refers to the selection of the variables in order to estimate individual social capital and the second stage refers to the exploration of the connection of the estimated social capital with the willing of individuals to contribute money for the environment.

**Table 1. Countries included in the study and sample size**

| Country | Sample Size | | Country | Sample Size |
|---|---|---|---|---|
| Austria | 1520 | | Italy | 2000 |
| Belgium | 1912 | | Lithuania | 1018 |
| Bulgaria | 1000 | | Luxembourg | 1211 |
| Belarus | 1000 | | Netherlands | 1003 |
| Czech Republic | 1908 | | Poland | 1095 |
| Denmark | 1023 | | Portugal | 1000 |
| Finland | 1038 | | Russian Federation | 2500 |
| France | 1615 | | Slovenia | 1006 |
| Germany | 2036 | | Spain | 1200 |
| Greece | 1142 | | Ukraine | 1195 |
| Iceland | 968 | | United Kingdom | 1000 |
| Ireland | 1012 | | Northern Ireland | 1000 |
| TOTAL SAMPLE: 31402 | | | | |

### *2.2. Variable selection for Measuring Social Capital*

In order to estimate social capital, Confirmatory Factor Analysis (CFA) was conducted, which permits testing hypotheses with a specific factor structure. In particular, 13 observed variables were selected -all of them measured in an ordinal scale- which were included in four factors:

a. The first factor measured *social networks* with a distinction between active and passive participation (as proposed by Beugeldsijk & van Schaik, 2005). The first variable displayed whether the individual was a member to at least one of a list of organizations presented in the questionnaire of the study (PASS), and the second whether the individual was a volunteer to at least one of these organizations (ACT).

[1] The selection of the 24 countries was based on the availability of all the variables included in the model of the study

b. The second factor examined *trust* referring both to social and institutional trust (see Paxton, 1999; Newton & Norris, 2000). In particular, five variables were included. The first one was the commonly used question of social trust (see Paxton, 1999; van Oorschot et al., 2006): 'Most people can be trusted or you can't be too careful' (STRUST). The remaining questions examined the level of trust on different types of institutions: the police, the national parliament, the civil services and the justice system (POLICE, PARL, CIVIL, JUST).
c. The third factor referred to *social norms*. Three indicative actions were chosen where individuals declared the level that they regarded them as justifiable (Claiming governmental benefits-BENF-, cheating on taxes- TEX- and someone accepting a bribe-BRIBE) (van Oorschot et al., 2006).
d. The final factor created was the level of *interest in politics* which is regarded a significant parameter of social capital (van Oorschot et al., 2006; Hjollund & Svensen, 2003; Narayan & Cassidy, 2001). Three variables were included: Whether the individual regarded politics as important in life (IMP), how often the individual discusses political matters with friends (DISC) and the frequency of following politics in the news (NEWS).

### *2.3. CFA model, Path Diagram and model fit*

For the estimation of individual social capital, CFA was conducted through the use of LISREL 8.8 software (Jöreskog and Sorbom, 1999). As mentioned above, a main advantage of CFA is that it allows testing hypotheses for a specific factor structure. The main method for estimating the model's parameters when data are measured in an ordinal scale is the method of Weighted Least Squares. The estimated CFA model of the study is presented via the path diagram of Figure 1. In the path diagram squares represent observed variables whereas circles represent the latent variables. Moreover, numerical values along each arrow correspond to factor loadings for each observed variable on the corresponding first-order latent variable and factor loadings of each first-order latent variable on the single second-order latent variable. Specifically, loadings appearing on the path diagram are the standardised factor loadings. After estimating the CFA model, we then examined the model fit. Chi-square statistic for testing model's adequacy was 2911.27 (d.f.=61, p-value<0.001) and accordingly, the null hypothesis that the model provides a good fit to the data was not rejected. In addition, in Table 2 indices values are presented along with the corresponding index boundaries suggested in the literature for accepting a close fit. According to these indices, CFA indicates that the second-order factor model tested provided a good fit to the 13 observed variables.

**Figure 1. Path Diagram**

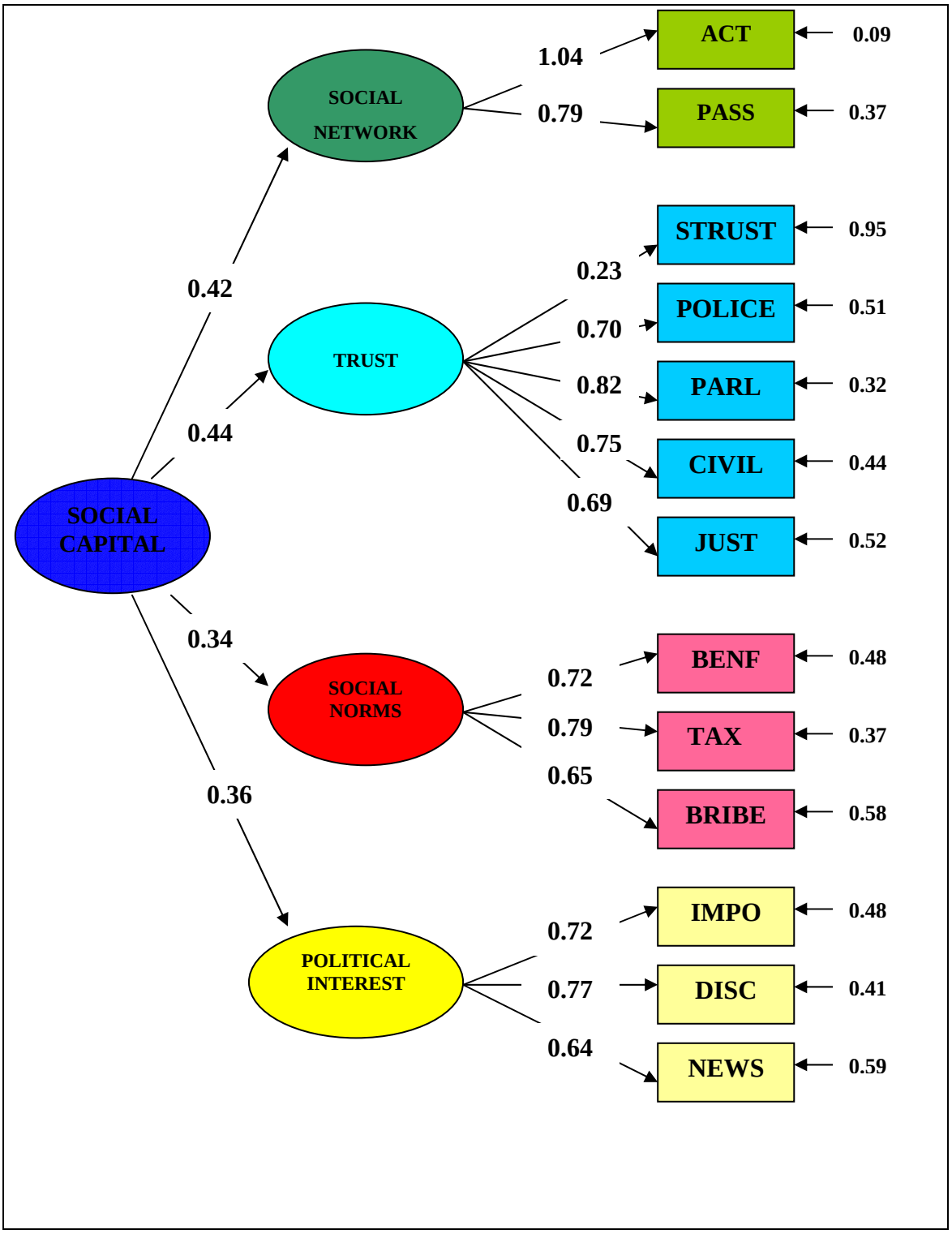

**Table 2. Goodness of fit Indices obtained by LISREL**

| Goodness of fit Indices | Index value for the second-order factor model | Accepted boundaries for close fit |
|---|---|---|
| **RMSEA** | 0.043 | 0.00-0.06 |
| **GFI** | 0.99 | >0.90 |
| **AGFI** | 0.99 | >0.90 |
| **NNFI** | 0.95 | >0.90 |
| **NFI** | 0.96 | >0.90 |
| **CFI** | 0.96 | >0.90 |

*2.4. Individual social capital*

CFA model fulfilled the requirement of strong associations between observed and latent variables (see Acito and Anderson, 1986), permitting us to proceed with the estimation of factor scores and utilize them for subsequent analysis. Specifically, as concerns the LISREL 8.80 program, factor scores for a CFA model may be derived by using the procedure of Anderson and Rubin (1956) (see also Jöreskog, 2000 for more details). To this end, factor scores for each individual of the sample were derived (Mels, 2004) of the second-order CFA model. Through individual social capital scores, mean social capital values for each European country included in the analysis were estimated (Table 3). Due to the response scales used in the EVS questionnaire, higher mean scores indicate lowest stocks of social capital and vice versa.

**Table 3. Average Social Capital Country Scores**

| **Country** | Mean | Std. Dev. | | **Country** | Mean | Std. Dev. |
|---|---|---|---|---|---|---|
| Austria | 0,601 | 0,130 | | Italy | 0,643 | 0,139 |
| Belgium | 0,707 | 0,172 | | Lithuania | 0,722 | 0,166 |
| Bulgaria | 0,651 | 0,128 | | Luxembourg | 0,676 | 0,158 |
| Belarus | 0,776 | 0,181 | | Netherlands | 0,601 | 0,122 |
| Czech Republic | 0,659 | 0,131 | | Poland | 0,646 | 0,133 |
| Denmark | 0,547 | 0,109 | | Portugal | 0,671 | 0,140 |
| Finland | 0,639 | 0,149 | | Russian Federation | 0,702 | 0,149 |
| France | 0,703 | 0,173 | | Slovenia | 0,698 | 0,153 |
| Germany | 0,631 | 0,153 | | Spain | 0,694 | 0,147 |
| Greece | 0,728 | 0,149 | | Ukraine | 0,721 | 0,169 |
| Iceland | 0,585 | 0,125 | | Great Britain | 0,655 | 0,148 |
| Ireland | 0,613 | 0,139 | | Northern Ireland | 0,649 | 0,148 |

## 3. Results

*3.1. Social capital and WTP*

In the second stage of the study, the connection between the estimated individual social capital scores and the willingness of individuals to contribute money for the environment was investigated. For this purpose the question '*Would give part of my income for the environment*' was selected (the WTP question). The four-scale polytomous variable of WTP included the following alternative answers: 'Strongly Agree', 'Agree', 'Disagree' and 'Strongly Disagree'. In Table 4, the average social capital scores calculated for each category of the WTP question are presented.

**Table 4: Average Social Capital for the various categories of WTP question**

| WTP | N | Average Social Capital score | Std. Dev. |
|---|---|---|---|
| Strongly agree | 4.086 | 0,647 | 0,157 |
| Agree | 13.450 | 0,652 | 0,150 |
| Disagree | 8.224 | 0,678 | 0,154 |
| Strongly disagree | 3.912 | 0,700 | 0,171 |
| **Total** | **29.672** | **0,665** | **0,156** |

As we observe, variations between average social capital scores for the four categories of the WTP question exist. Nevertheless, it can not yet be concluded whether these differences are statistically significant. For this purpose, a multivariate OLS regression model was assumed, where the dependent variable is 'Social Capital' and dummy variables created by the levels of the WTP question were utilized as independent variables. Through this process it may be determined whether there is a statistically significant difference within the four categories of the WTP question.

Specifically, WTP question was recoded into a set of dummy variables each of which having two levels (0 and 1). Since willingness to pay has four levels, only three of them had to be recoded. We chose not to recode (i.e. use as a reference category) the category with the highest frequency (in our case the "agree" level, which corresponds to 45.3% of the sample). Data were analysed using the SPSS statistical package (Norusis, 2006). Through the results of the fitted regression model (Table 5) it is observed that all OLS regression variables are significant (p-value<0.05). **Consequently, citizens who 'disagree', 'strongly agree' and 'strongly disagree' tend to exceed significantly different social capital scores compared to citizens who 'agree'**

**on the WTP question**. Specifically, those who disagree, and those who strongly disagree – since the beta coefficients are positive – exceed higher social capital scores, while those who strongly agree exceed lower social capital scores (negative sign on the beta coefficient).

**Table 5. OLS Regression of Willingness to Pay on Average Social Capital**

| | **Coefficient** | **Std. Error** | **p-value** |
|---|---|---|---|
| Constant | 0.655 | 0.001 | 0.000 |
| **WTP (ref.: Agree)** | | | |
| Disagree | 0.023 | 0.002 | 0.000 |
| Strongly Agree | -0.008 | 0.003 | 0.004 |
| Strongly Disagree | 0.045 | 0.003 | 0.000 |
| | | | |
| R | 0.109 | | |
| R square | 0.012 | | |

*3.2. Association between Social Capital and WTP, while Controlling for Gender, Age, Education and Income*

In the previous section the close connection between social capital and WTP was demonstrated. However, in order to complete the analysis it was necessary to examine the potential influence of factors such as income and age of the respondents on social capital. Moreover, it was important to examine if the association of WTP and social capital remains statistically significant even after controlling for the influence of the specific factors on the distribution of social capital. The socio-economic characteristics selected for this purpose where: Gender, Age, Education level and Income level. The proposed OLS model, in addition to the 3 dummy variables for willingness to pay, includes dummy variables standing for Gender (reference category: females), Age (recoded into three intervals-15-29, 30-49 and 50+ with reference category: 50+), Educational level (reference category: middle) and Income level (reference category: Medium). The results of the fitted OLS model are summarized in Table 6.

From Table 6 it is evident that statistically significant differences among the categories of WTP, as concerns average social capital, are still observable even after controlling for gender, age, education and income level (p-value<0.05). Additionally, the multiple regression analysis conducted clearly shows that average social capital scores between age categories ‘15-29’ and ‘30-49’ differ statistically significantly when compared to the reference category of the age

variable (p-values<0.001), and average social capital for the respondents of low and high income differs statistically significantly compared to the social capital of medium income respondents. By inspecting beta coefficients, we may argue that younger respondents tend to exceed higher social capital scores when compared to oldest respondents, while low income respondents have higher scores when compared to medium income level respondents.

**Table 6. OLS Regression of WTP, Gender, Age, Education and Income on Average Social Capital**

| | Coefficient | Std. Error | p-value |
|---|---|---|---|
| Constant | 0.621 | 0.002 | 0.000 |
| **WTP (ref.: Agree)** | | | |
| Disagree | 0.025 | 0.002 | 0.000 |
| Strongly Agree | -0.007 | 0.003 | 0.012 |
| Strongly Disagree | 0.048 | 0.003 | 0.000 |
| **Gender (ref.: Female)** | | | |
| Male | -0.001 | 0.002 | 0.494 |
| **Age (ref.: 50+)** | | | |
| 15-29 | 0.091 | 0.002 | 0.000 |
| 30-49 | 0.045 | 0.002 | 0.000 |
| **Educational level (ref: Middle)** | | | |
| Lower | 0.000 | 0.002 | 0.837 |
| Upper | -0.024 | 0.002 | 0.000 |
| **Income level (ref: Medium)** | | | |
| Low | 0.010 | 0.002 | 0.000 |
| High | 0.002 | 0.002 | 0.000 |
| | | | |
| R | 0.250 | | |
| R square | 0.063 | | |

Regarding, educational level, there were no statistical significant differences between average scores of respondents of middle and lower education (p-value=0.837), while respondents of upper educational level differ statistically significantly when compared to respondents of middle and lower education (p-value<0.001). Finally, the current analysis provided evidence of no differences of social capital between males and females since that both genders exceed approximately similar social capital scores (beta coefficient: -0.001, p-value=0.494).

## Conclusions

The purpose of this article was to explore the connection between individual social capital and the willingness to contribute money for the environment. Through the analysis it was observed that individuals with higher stocks of social capital present a higher tendency of willing to pay. This conclusion is valid even after investigating the influence of other important social factors. These assumptions are according to the growing literature which emphasizes that certain elements of social capital, such as the level of social trust and the compliance to social norms, may influence the management of natural resources from community members and even further, should be taken into consideration during environmental policy planning. In addition, the contribution of money for the environment may be regarded an action of the common benefit. Consequently through the study one may assume that individuals with higher stocks of social capital tend to act in a collective manner for the benefit of their community, at least on the level of a public good such as the natural environment.

For further improvement of future research we may underline some main issues. Firstly, the WTP question used in the study does not indicate a certain amount (as it is common in environmental valuation studies). It is an interesting task to explore the influence of social capital with specific numeric valuations. The introduction of elements of social capital on environmental valuation studies may also provide significant information thus improving the explanation of WTP. Another important issue regarding the present study refers to the measurement of social capital. In particular, the selection of the ‘components’ of social capital and their variables has been conducted according to the relevant literature. Nevertheless, there are no widely acceptable variables and measurement techniques for quantifying social capital. Consequently, although we regard that the measurement conducted in this study was satisfying in the context of its purpose; further improvements may be introduced for the measurement techniques of social capital.

Concluding, research on the connection between social capital and its influence on issues of environmental policy and management has increased rapidly in the past decade. Emphasis on certain social factors, such as social capital, for environmental issues indicates the importance of individuals, as members of a community, for the conservation and improvement of natural resources. Further research may contribute to the specification of such connections and increase their usefulness on issues of environmental policy and planning.

**References**


Acito, F. and Anderson, R.D. (1986). A Simulation Study of Factor Score Indeterminacy. Journal of Marketing Research, Vol. 23, pp. 111-118.

Anderson, T.W. and Rubin, H. (1956). Statistical Inference in Factor Analysis, in: Proceedings of the Third Berkeley Symposium on Mathematical Statistics and Probability V, 111-150.

Beugelsdijk S., Schaik T.V. (2005). Differences in Social Capital between 54 Western European Regions. *Regional Studies*, 39(8):1053-64.

Bourdieu P. (1986). The forms of capital. In: Richardson J.G., ed. Handbook of Theory and Research for the Sociology of Education.New York: Greenwood Press, pp. 241-58.

Coleman J.S. (1990). Foundations of Social Theory. Cambridge, MA, Belknap Press of Harvard University Press.

Flora C.B. (1995). Social capital and sustainability: Agriculture and communities in the Great Plains and Corn Belt. *Research in Rural Sociology and Development*, 6:227-46.

Hjollund L., Svendsen G.T. (2003). Social capital: A standard method of measurement. In: Paldam M., Svendsen G.T., eds. Trust, Social Capital and Economic Growth. Cheltenham: Edward Elgar.

Jones N. (2006). The role of social capital in environmental policy and management. *International Journal of the Interdisciplinary Social Sciences,* 1(3):163-8.

Jones N., Malesios C., Sophoulis C.M. (2007) Economic valuation of coastal water quality and protest responses: A case study in Mitilini, Greece. *Journal of Socio-Economics*. In press.

Jöreskog, K.G, Sörbom, D. (1999) *LISREL 8 User's Reference Guide*. Scientific Software International, Lincolnwood, IL

Jöreskog, K.G. (2000). Latent Variable Scores and Their Uses. Lincolnwood, IL: Scientific Software International (available at: http://www.ssicentral.com/lisrel/corner.htm).

Mels, G. (2004) *The Student Edition of LISREL 8.7 for Windows: Getting Started Guide* Scientific Software International, Lincolnwood, IL

Mitchell R.C., Carson R.T. (1989). Using surveys to value public goods, The contingent valuation method. Washington DC: Resources For the Future.

Narayan D., Cassidy M.F. (2001). A Dimensional Approach to Measuring Social Capital: Development and Validation of a Social Capital Inventory. *Current Sociology*, 49(2):59-102.

Newton K., Norris P. (2000). Confidence in Public Institutions: Faith, Culture, or Performance? In: Pharr S.J., Putnam R., eds. Disaffected Democracies: What's troubling the trilateral countries. Princeton NJ: Princeton University Press, pp. 52-73.

Norusis, M. (2006) *SPSS 14.0 Guide to Data Analysis*, Prentice Hall, Upper Saddle River, NJ

Paxton P. (1990). Is Social Capital Declining in the United States? A Multiple Indicator Assessment. *American Journal of Sociology*, 105:88-127.

Poortinga W. (2006). Social capital: An individual or collective resource for health? *Social Epidemiology*, 62:292-302.

Pretty J. (2003). Social Capital and the Collective Management of Resources. *Science*, 302:1912-4.

Putnam R., with Leonardi R.and Nanetti R.Y. (1993). Making Democracy Work: Civic traditions in modern Italy. New Jersey: Princeton University Press.

Putnam R. (2000) Bowling alone: The collapse and revival of American community. New York: Simon & Schuster Paperbacks.

Sandefur G.D., Meier A.M., Campbell M.E. (2006). Family resources, social capital and college attendance. *Social Science Research*, 35:525-53.

Selman P. (2001) Social Capital, Sustainability and Environmental Planning. *Planning Theory and Practice*, 2(1):13-30.

van Oorschot W., Arts W., Gelissen J. (2006). Social capital in Europe. Measurement and Social and Regional Distribution of a Multifaceted Phenomenon. *Acta Sociologica*, 49(2):149-76.